J E S G I Sw K Ch Ck

fx-5800P

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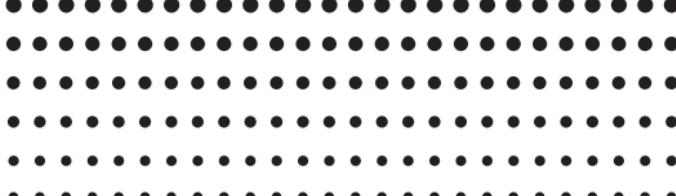
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#01

1-1	m_p	$1.67262171 \times 10^{-27}$ kg	3-5	μ_μ	$-4.49044799 \times 10^{-26}$ J T^{-1}
1-2	m_n	$1.67492728 \times 10^{-27}$ kg	3-6	F	96485.3383 C mol^{-1}
1-3	m_e	$9.1093826 \times 10^{-31}$ kg	3-7	e	$1.60217653 \times 10^{-19}$ C
1-4	m_μ	$1.8835314 \times 10^{-28}$ kg	3-8	N_A	6.0221415×10^{23} mol^{-1}
1-5	a_0	$0.5291772108 \times 10^{-10}$ m	4-1	k	$1.3806505 \times 10^{-23}$ J K^{-1}
1-6	h	$6.6260693 \times 10^{-34}$ J s	4-2	V_m	22.413996×10^{-3} m^3 mol^{-1}
1-7	μ_N	$5.05078343 \times 10^{-27}$ J T^{-1}	4-3	R	8.314472 J mol^{-1} K^{-1}
1-8	μ_B	$927.400949 \times 10^{-26}$ J T^{-1}	4-4	C_0	299792458 m s^{-1}
2-1	$\hbar$	$1.05457168 \times 10^{-34}$ J s	4-5	C_1	$3.74177138 \times 10^{-16}$ W m^2
2-2	α	$7.297352568 \times 10^{-3}$	4-6	C_2	1.4387752×10^{-2} m K
2-3	r_e	$2.817940325 \times 10^{-15}$ m	4-7	σ	5.670400×10^{-8} W m^{-2} K^{-4}
2-4	λ_c	$2.426310238 \times 10^{-12}$ m	4-8	ε_0	$8.854187817 \times 10^{-12}$ F m^{-1}
2-5	γ_p	2.67522205×10^{8} s^{-1} T^{-1}	5-1	μ_0	$12.566370614 \times 10^{-7}$ N A^{-2}
2-6	λ_{cp}	$1.3214098555 \times 10^{-15}$ m	5-2	ϕ_0	$2.06783372 \times 10^{-15}$ Wb
2-7	λ_{cn}	$1.3195909067 \times 10^{-15}$ m	5-3	g	9.80665 m s^{-2}
2-8	R_∞	10973731.568525 m^{-1}	5-4	G_0	$7.748091733 \times 10^{-5}$ S
3-1	u	$1.66053886 \times 10^{-27}$ kg	5-5	Z_0	376.730313461 Ω
3-2	μ_p	$1.41060671 \times 10^{-26}$ J T^{-1}	5-6	t	273.15 K
3-3	μ_e	$-928.476412 \times 10^{-26}$ J T^{-1}	5-7	G	6.6742×10^{-11} m^3 kg^{-1} s^{-2}
3-4	μ_n	$-0.96623645 \times 10^{-26}$ J T^{-1}	5-8	atm	101325 Pa

#02

$$a = \frac{n\cdot\Sigma x_i y_i - \Sigma x_i\cdot\Sigma y_i}{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2}$$

$$b = \frac{\Sigma y_i - a\cdot\Sigma x_i}{n}$$

$$r = \frac{n\cdot\Sigma x_i y_i - \Sigma x_i\cdot\Sigma y_i}{\sqrt{\{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2\}\{n\cdot\Sigma y_i^2 - (\Sigma y_i)^2\}}}$$

$$\hat{x} = \frac{y - b}{a}$$

$$\hat{y} = ax + b$$

#03

$$a = \frac{Sx^2y\cdot Sxx - Sxy\cdot Sxx^2}{Sxx\cdot Sx^2x^2 - (Sxx^2)^2}$$

$$b = \frac{Sxy\cdot Sx^2x^2 - Sx^2y\cdot Sxx^2}{Sxx\cdot Sx^2x^2 - (Sxx^2)^2}$$

$$c = \frac{\Sigma y_i}{n} - a\left(\frac{\Sigma x_i^2}{n}\right) - b\left(\frac{\Sigma x_i}{n}\right)$$

$$Sxx = \Sigma x_i^2 - \frac{(\Sigma x_i)^2}{n}$$

$$Sxy = \Sigma x_i y_i - \frac{(\Sigma x_i\cdot\Sigma y_i)}{n}$$

$$Sxx^2 = \Sigma x_i^3 - \frac{(\Sigma x_i\cdot\Sigma x_i^2)}{n}$$

$$Sx^2x^2 = \Sigma x_i^4 - \frac{(\Sigma x_i^2)^2}{n}$$

$$Sx^2y = \Sigma x_i^2 y_i - \frac{(\Sigma x_i^2\cdot\Sigma y_i)}{n}$$

$$\hat{x}1 = \frac{-b + \sqrt{b^2 - 4a(c - y)}}{2a}$$

$$\hat{x}2 = \frac{-b - \sqrt{b^2 - 4a(c - y)}}{2a}$$

$$\hat{y} = ax^2 + bx + c$$

#04

$$a = \frac{\Sigma y_i - b\cdot\Sigma \ln x_i}{n}$$

$$b = \frac{n\cdot\Sigma(\ln x_i)y_i - \Sigma\ln x_i\cdot\Sigma y_i}{n\cdot\Sigma(\ln x_i)^2 - (\Sigma\ln x_i)^2}$$

$$r = \frac{n\cdot\Sigma(\ln x_i)y_i - \Sigma\ln x_i\cdot\Sigma y_i}{\sqrt{\{n\cdot\Sigma(\ln x_i)^2 - (\Sigma\ln x_i)^2\}\{n\cdot\Sigma y_i^2 - (\Sigma y_i)^2\}}}$$

$$\hat{x} = e^{\frac{y - a}{b}}$$

$$\hat{y} = a + b\ln x$$

#05

$$a = \exp\left(\frac{\Sigma \ln y_i - b\cdot\Sigma x_i}{n}\right)$$

$$b = \frac{n\cdot\Sigma x_i \ln y_i - \Sigma x_i\cdot\Sigma \ln y_i}{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2}$$

$$r = \frac{n\cdot\Sigma x_i \ln y_i - \Sigma x_i\cdot\Sigma \ln y_i}{\sqrt{\{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2\}\{n\cdot\Sigma(\ln y_i)^2 - (\Sigma \ln y_i)^2\}}}$$

$$\hat{x} = \frac{\ln y - \ln a}{b}$$

$$\hat{y} = ae^{bx}$$

#06

$$a = \exp\left(\frac{\Sigma \ln y_i - \ln b\cdot\Sigma x_i}{n}\right)$$

$$b = \exp\left(\frac{n\cdot\Sigma x_i \ln y_i - \Sigma x_i\cdot\Sigma \ln y_i}{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2}\right)$$

$$r = \frac{n\cdot\Sigma x_i \ln y_i - \Sigma x_i\cdot\Sigma \ln y_i}{\sqrt{\{n\cdot\Sigma x_i^2 - (\Sigma x_i)^2\}\{n\cdot\Sigma(\ln y_i)^2 - (\Sigma \ln y_i)^2\}}}$$

$$\hat{x} = \frac{\ln y - \ln a}{\ln b}$$

$$\hat{y} = ab^{x}$$

#07

$$a = \exp\left(\frac{\Sigma \ln y_i - b\cdot\Sigma \ln x_i}{n}\right)$$

$$b = \frac{n\cdot\Sigma \ln x_i \ln y_i - \Sigma \ln x_i\cdot\Sigma \ln y_i}{n\cdot\Sigma(\ln x_i)^2 - (\Sigma \ln x_i)^2}$$

$$r = \frac{n\cdot\Sigma \ln x_i \ln y_i - \Sigma \ln x_i\cdot\Sigma \ln y_i}{\sqrt{\{n\cdot\Sigma(\ln x_i)^2 - (\Sigma \ln x_i)^2\}\{n\cdot\Sigma(\ln y_i)^2 - (\Sigma \ln y_i)^2\}}}$$

$$\hat{x} = e^{\frac{\ln y - \ln a}{b}}$$

$$\hat{y} = ax^{b}$$

#08

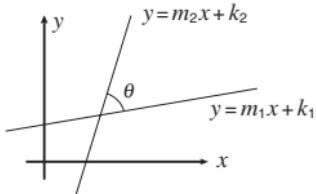
$$a = \frac{\Sigma y_i - b \cdot \Sigma x_i^{-1}}{n}$$

$$b = \frac{Sxy}{Sxx}$$

$$r = \frac{Sxy}{\sqrt{Sxx \cdot Syy}}$$

$$Sxx = \Sigma (x_i^{-1})^2 - \frac{(\Sigma x_i^{-1})^2}{n}$$

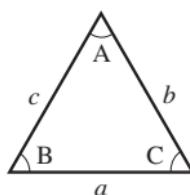
$$Syy = \Sigma y_i^2 - \frac{(\Sigma y_i)^2}{n}$$

$$Sxy = \Sigma (x_i^{-1}) y_i - \frac{\Sigma x_i^{-1} \cdot \Sigma y_i}{n}$$

$$\hat{x} = \frac{b}{y - a}$$

$$\hat{y} = a + \frac{b}{x}$$

#09

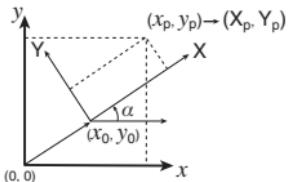
1 $\tan\theta = \dfrac{m_2 - m_1}{1 + m_1 m_2} \quad (m_1 m_2 \neq 1)$

2 $a = \dfrac{\upsilon_2 - \upsilon_1}{t_2 - t_1} \quad (t_2 > t_1 \geqq 0)$

3 $S = \upsilon_0 t + \dfrac{1}{2} a t^2 \quad (t \geqq 0)$

4 $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

$\cos B = \dfrac{c^2 + a^2 - b^2}{2ca}$

$\cos C = \dfrac{a^2 + b^2 - c^2}{2ab}$

5 $S = \dfrac{n\{2a + (n-1)d\}}{2}$

6 $\upsilon = \sqrt{\dfrac{3RT}{M}}$ $(M, T > 0)$

7 $[(x_p, y_p) \rightarrow (X_p, Y_p)]$

$$X_p = (x_p - x_0)\cos\alpha + (y_p - y_0)\sin\alpha$$

$$Y_p = (y_p - y_0)\cos\alpha - (x_p - x_0)\sin\alpha$$

y, $(x_p, y_p) \rightarrow (X_p, Y_p)$, Y, X, α, (x_0, y_0), (0, 0), x

8 $\left[\dfrac{P}{\gamma} + \dfrac{\upsilon^2}{2g} + Z = \text{Const.}\right]$

$$P_2 = P_1 + \gamma\left(\frac{\upsilon_1{}^2 - \upsilon_2{}^2}{2g} + Z_1 - Z_2\right) \quad (\upsilon, P, \gamma, Z > 0)$$

9 $\left[\dfrac{P}{\gamma} + \dfrac{\upsilon^2}{2g} + Z = \text{Const.}\right]$

$$\upsilon_2 = \sqrt{\frac{2g(P_1 - P_2)}{\gamma} + \upsilon_1{}^2 + 2g(Z_1 - Z_2)} \quad (\upsilon, P, \gamma, Z > 0)$$

10 $\left[\dfrac{P}{\gamma} + \dfrac{\upsilon^2}{2g} + Z = \text{Const.}\right]$

$$Z_2 = \frac{P_1 - P_2}{\gamma} + \frac{\upsilon_1{}^2 - \upsilon_2{}^2}{2g} + Z_1 \quad (\upsilon, P, \gamma, Z > 0)$$

11 $P_x = {}_nC_x P^x (1 - P)^{n-x} \begin{pmatrix} 0 \leqq P \leqq 1 \\ x = 0, 1, 2 \cdots\cdots \end{pmatrix}$

12 $\text{Pol}(X_B - X_A, Y_B - Y_A)$

$$X_P = \ell \cos\alpha + X_A$$

$$Y_P = \ell \sin\alpha + Y_A$$

(X_B, Y_B), (X_p, Y_p), α, ℓ, (X_A, Y_A)

13 $\eta = \dfrac{Q_1 - Q_2}{Q_1}$ $(Q_1 \neq 0)$

14	$\eta = \frac{T_1 - T_2}{T_1}$ $(T_1 \neq 0)$
15	$F = mr\omega^2$ $(m,\ r,\ \omega > 0)$
16	$F = m\frac{\upsilon^2}{r}$ $(r,\ m,\ \upsilon > 0)$
17	$\upsilon = \sqrt{\frac{T}{\sigma}}$ $(T, \sigma > 0)$
18	$S_0 = \pi r \ell$ $(r,\ \ell \geqq 0)$
19	$V = \frac{1}{3}\pi r^2 h$ $(r,\ h \geqq 0)$
20	$S_0 = 2\pi rh$ $(r,\ h \geqq 0)$
21	$V = \pi r^2 h$ $(r,\ h \geqq 0)$
22	$T = \frac{2\pi}{\omega}$ $(\omega \neq 0)$
23	$T = \frac{2\pi r}{\upsilon}$ $(\upsilon \neq 0)$
24	$T = \frac{1}{f}$ $(f > 0)$
25	$S = \pi r^2$ $(r \geqq 0)$
26	$R = \rho\frac{\ell}{S}$ $(S,\ \ell,\ \rho > 0)$
27	$[A_1\upsilon_1\rho_1 = A_2\upsilon_2\rho_2 = \mathrm{Const.}]$ $\upsilon_2 = \frac{A_1\upsilon_1\rho_1}{A_2\rho_2}$ $(A_2, \rho_2 > 0)$
28	$[A_1\upsilon_1\rho_1 = A_2\upsilon_2\rho_2 = \mathrm{Const.}]$ $A_2 = \frac{A_1\upsilon_1\rho_1}{\upsilon_2\rho_2}$ $(\upsilon_2 \neq 0,\ \rho_2 > 0)$

29 $R_1 = \dfrac{R_4R_5 + R_5R_6 + R_6R_4}{R_5}$

$R_2 = \dfrac{R_4R_5 + R_5R_6 + R_6R_4}{R_6}$

$R_3 = \dfrac{R_4R_5 + R_5R_6 + R_6R_4}{R_4}$ $(R_4, R_5, R_6 > 0)$

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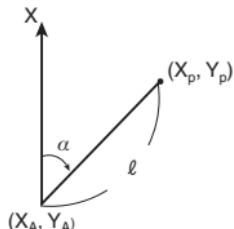
30 $R_4 = \dfrac{R_1R_2}{R_1 + R_2 + R_3}$, $R_5 = \dfrac{R_2R_3}{R_1 + R_2 + R_3}$, $R_6 = \dfrac{R_3R_1}{R_1 + R_2 + R_3}$

$(R_1, R_2, R_3 > 0)$

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31 $[(X_A, Y_A), \mathrm{Rec}(\ell, \alpha) \rightarrow (X_p, Y_p)]$

$X_P = \ell \cos\alpha + X_A$

$Y_P = \ell \sin\alpha + Y_A$

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32 $a^2 = b^2 + c^2 - 2bc \cos A \rightarrow a = \sqrt{b^2 + c^2 - 2bc \cos A}$

$b^2 = c^2 + a^2 - 2ca \cos B$ $(b, c > 0, 0^\circ < A < 180^\circ)$

$c^2 = a^2 + b^2 - 2ab \cos C$

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33 $F = \dfrac{1}{4\pi\varepsilon_0} \dfrac{Qq}{r^2}$ $(r > 0)$

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34 $S = 1^3 + 2^3 + \cdots\cdots + n^3 = \left\{\dfrac{n(n+1)}{2}\right\}^2$

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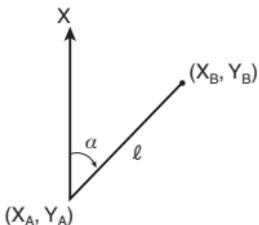
35 $A_i[dB] = 20 \log_{10}\left(\dfrac{I_2}{I_1}\right)$ $[dB]$ $(I_2 / I_1 > 0)$

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36 $y = \dfrac{x - x_A}{\sigma} \times 10 + 50$ $(\sigma > 0)$

37 $\mathrm{Pol}(X_B - X_A,\ Y_B - Y_A)$

X
(X_B, Y_B)
α
ℓ
(X_A, Y_A)

38 $f = f_0 \dfrac{\upsilon - u}{\upsilon - \upsilon_0} \quad \left(\upsilon \neq \upsilon_0,\ f_0 > 0,\ \dfrac{\upsilon - u}{\upsilon - \upsilon_0} > 0\right)$

39 $S = \upsilon_0 t + \dfrac{1}{2} g t^2 \qquad (t \geqq 0)$

40 $U_p = \dfrac{1}{2} k x^2 \qquad (k,\ x > 0)$

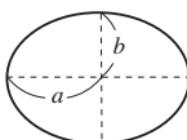
41 $W = \dfrac{1}{2} CV^2$

42 $W = \dfrac{1}{2} \dfrac{Q^2}{C} \qquad (C > 0)$

43 $W = \dfrac{1}{2} QV$

44 $W = \dfrac{1}{2} ED \qquad (E,\ D > 0)$

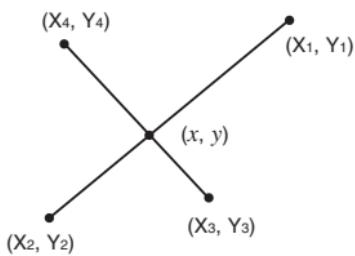
45 $W = \dfrac{1}{2} \varepsilon E^2 \qquad (\varepsilon,\ E > 0)$

46 $E = \dfrac{Q}{4 \pi \varepsilon_0 r^2} \left(= 9 \times 10^9 \dfrac{Q}{r^2} \right) \qquad (r > 0)$

47 $f = \dfrac{1}{2 \pi \sqrt{LC}} \qquad (L,\ C > 0)$

48 $S = \pi a b \qquad (a,\ b \geqq 0)$

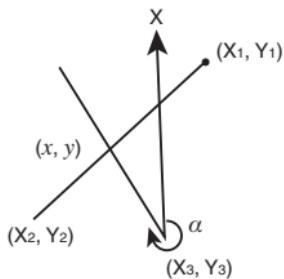
b
a

49 $H = U + PV \quad (U,\ P,\ V > 0)$

50	$y = \lambda e^{-\lambda x} \quad x > 0$ $y = 0 \quad x \leqq 0$	$(\lambda > 0)$
51	$P_x = (1 - P)^x P$	$\begin{pmatrix} x = 0, 1, 2\cdots\cdots \\ 0 < P \leqq 1 \end{pmatrix}$
52	$S = \dfrac{a\,(r^n - 1)}{r - 1}$	$(r \neq 1)$
53	$Q = mcT$	
54	$S = \sqrt{s(s-a)(s-b)(s-c)},\ s = \dfrac{a+b+c}{2}$	$\begin{pmatrix} a+b>c>0 \\ b+c>a>0 \\ c+a>b>0 \end{pmatrix}$
55	$P_x = \dfrac{{}_k C_x \cdot {}_{N-k} C_{n-x}}{{}_N C_n}$	$(0 \leqq k \leqq N,\ 0 \leqq n \leqq N)$
56	$V_e = \upsilon B \ell$	$(\upsilon,\ B,\ \ell > 0)$
57	$P = \dfrac{nRT}{V}$	$(n,\ T,\ V > 0)$
58	$V = \dfrac{nRT}{P}$	$(n,\ T,\ P > 0)$
59	$T = \dfrac{PV}{nR}$	$(P,\ V,\ n > 0)$
60	$n = \dfrac{PV}{RT}$	$(P,\ V,\ T > 0)$
61	$\sin ic = \dfrac{1}{n_{12}}$	$(1 \leqq n_{12})$
62	$W = \dfrac{1}{2} L I^2$	$(L,\ I > 0)$

63 $x = \dfrac{nX_3 - mX_1 + Y_1 - Y_3}{n - m}$

$y = m\,(x - X_1) + Y_1$

$$\left(\begin{array}{l} m = \dfrac{Y_2 - Y_1}{X_2 - X_1} \\ n = \dfrac{Y_4 - Y_3}{X_4 - X_3} \end{array} \right)$$

(X_4, Y_4) (X_1, Y_1) (x, y) (X_2, Y_2) (X_3, Y_3)

64 $x = \dfrac{nX_3 - mX_1 + Y_1 - Y_3}{n - m}$

$y = m\,(x - X_1) + Y_1$

$$\left(\begin{array}{l} m = \dfrac{Y_2 - Y_1}{X_2 - X_1} \\ n = \tan\alpha \end{array} \right)$$

X (X_1, Y_1) (x, y) (X_2, Y_2) α (X_3, Y_3)

65 $P = RI^2 \qquad (R > 0)$

66 $P = \dfrac{V^2}{R} \qquad (R > 0)$

67 $U_k = \dfrac{1}{2}\, m\upsilon^2 \qquad (m, \upsilon > 0)$

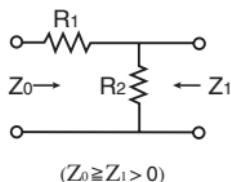
68 $X = 2\pi f L - \dfrac{1}{2\pi f C} \; \left(= \omega L - \dfrac{1}{\omega C} = X_L - X_C \right) \qquad (f, L, C > 0)$

69 $Z = \sqrt{R^2 + (2\pi f L)^2} \; \left(= \sqrt{R^2 + \omega^2 L^2} \right) \qquad (R, f, L > 0)$

70 $Z = \dfrac{1}{\sqrt{\left(\dfrac{1}{R}\right)^2 + \left(2\pi f C - \dfrac{1}{2\pi f L}\right)^2}} \qquad (R, f, C, L > 0)$

71 $Z = \sqrt{R^2 + \left(2\pi f L - \dfrac{1}{2\pi f C}\right)^2} \; \left(= \sqrt{R^2 + \left(\omega L - \dfrac{1}{\omega C}\right)} \right)$

$(R, f, L, C > 0)$

72 $F = mH \qquad (m, H > 0)$

73 $T = \frac{1}{2} mv^2 = \frac{1}{2} \frac{q^2B^2}{m} R^2$ $(m > 0, B > 0, R > 0)$

74 $F = iB\ell \sin\theta$ $(\ell > 0, 0^\circ \leqq |\theta| \leqq 90^\circ)$

75 $R_1 = Z_0 \sqrt{1 - \frac{Z_1}{Z_0}}, R_2 = \frac{Z_1}{\sqrt{1 - \frac{Z_1}{Z_0}}}$

$L_{min} = 20 \log \left(\sqrt{\frac{Z_0}{Z_1}} + \sqrt{\frac{Z_0}{Z_1} - 1} \right)$ $[dB]$

R1
Z0→ R2 ← Z1

$(Z_0 \geqq Z_1 > 0)$

76 $\left[M = \frac{D_1}{Z_1} = \frac{D_2}{Z_2} = \frac{P}{\pi} \right]$

$M = \frac{D}{Z}$ $(D, Z > 0)$

77 $\left[M = \frac{D_1}{Z_1} = \frac{D_2}{Z_2} = \frac{P}{\pi} \right]$

$M = \frac{P}{\pi}$ $(P > 0)$

78 $\left[M = \frac{D_1}{Z_1} = \frac{D_2}{Z_2} = \frac{P}{\pi} \right]$

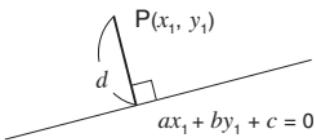
$D_2 = \frac{D_1Z_2}{Z_1}$ $(D_1, Z_1, Z_2 > 0)$

79 $\left[M = \frac{D_1}{Z_1} = \frac{D_2}{Z_2} = \frac{P}{\pi} \right]$

$D = \frac{PZ}{\pi}$ $(P, Z > 0)$

80 $y = \frac{1}{\sqrt{2\pi}\,\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$ $(\sigma > 0)$

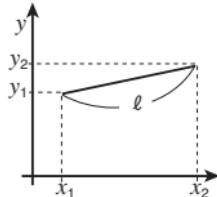
81 $Y_R = \frac{1}{R}, Y_X = 2\pi fC - \frac{1}{2\pi fL}$ $(R, f, C, L > 0)$

82 $S = ab \sin\alpha$ $\left(\begin{array}{l} a, b \geqq 0 \\ 0^\circ < \alpha < 180^\circ \end{array} \right)$

83 $C = \dfrac{\varepsilon S}{d}$ $(S, d > 0)$

84 $d = \dfrac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$ $(a, b \neq 0)$

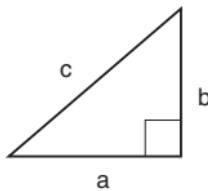
P(x_1, y_1)
d
$ax_1 + by_1 + c = 0$

85 $\ell = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

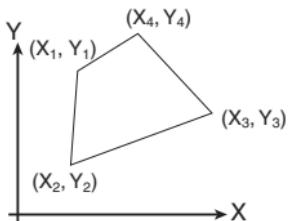
y
y_2
y_1
ℓ
x_1
x_2

86 $P_x = \dfrac{\mu^x e^{-\mu}}{x\,!}$ $\begin{pmatrix} x = 0, 1, 2\cdots\cdots \\ 0 < \mu \end{pmatrix}$

87 $U_p = mgh$ $(m, h > 0)$

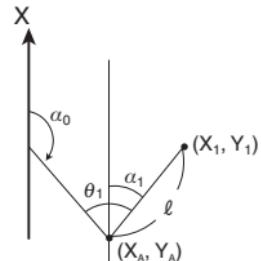
88 $\cos\varphi = \dfrac{R}{Z} \left(= \dfrac{P}{EI}\right)$ $(R > 0)$

89 $A_p\,[dB] = 10 \log_{10}\left(\dfrac{P_2}{P_1}\right)$ $[dB]$ $(P_2 / P_1 > 0)$

90 $V = \dfrac{1}{3} Ah$ $(A, h \geqq 0)$

91 $a^2 + b^2 = c^2$

c
b
a

92 $S = \dfrac{\left|(X_1 - X_2)(Y_3 - Y_1) + (X_1 - X_3)(Y_4 - Y_2) + (X_1 - X_4)(Y_1 - Y_3)\right|}{2}$

(X₄, Y₄) (X₁, Y₁) (X₃, Y₃) (X₂, Y₂) X Y

93 $V_R = V \cdot e^{-\frac{t}{CR}}$

94 $Z = \sqrt{R^2 + \dfrac{1}{(2\pi f C)^2}} \left(= \sqrt{R^2 + \dfrac{1}{\omega^2 C^2}} \right)$ (R, f, C > 0)

95 **Deg**

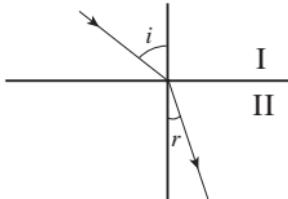
$[X_n = X_A + \ell_n \cos\alpha_n,\ Y_n = Y_A + \ell_n \sin\alpha_n]$

$\alpha_n = \alpha_0 + \theta_n - 180$: $X_n = X_A + \ell_n \cos\alpha_n$

$Y_n = Y_A + \ell_n \sin\alpha_n$

X α_0 (X₁, Y₁) θ_1 α_1 ℓ (X_A, Y_A)

96 $n = \dfrac{\sin i}{\sin r}$ (i, r > 0)

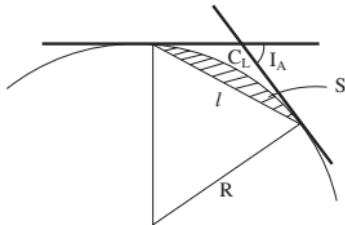
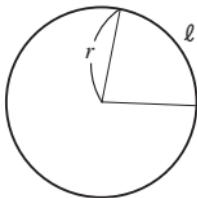
i I II r

97 ${}_n H_r = \dfrac{(n + r - 1)!}{r!\,(n - 1)!}$ $\begin{pmatrix} 0 \leqq r \\ 1 \leqq n \end{pmatrix}$

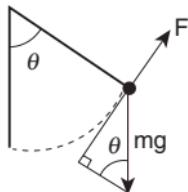
98 ${}_n \Pi_r = n^r$

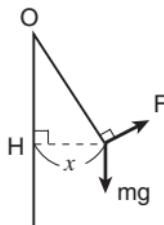
99 $R = \dfrac{u\ell}{v}$ ($v \neq 0$)

100 $E = \dfrac{1}{2} I\omega^2$ (I, ω > 0)

101 $Z_R = R, Z_X = 2\pi f L - \dfrac{1}{2\pi f C}$ $(R,\ f, L, C, Z > 0)$

102 **Deg** $I_A = 2\sin^{-1} \dfrac{l}{2R}$

$S = \dfrac{\pi R^2 I_A}{360} - \dfrac{R^2}{2} \sin I_A$

$C_L = \dfrac{\pi}{180} \times R \times I_A$

103 $S = \dfrac{1}{2} r \ell$ $(r, \ell \geqq 0)$

104 $\tau = \dfrac{P}{A}$ $(A, P > 0)$

105 $\tau = G\gamma$ $(G, \gamma > 0)$

106 $F = -mg \sin\theta$ $(m > 0)$

107 $F = -\dfrac{mg}{\ell} x$ $\begin{pmatrix} \ell > 0 \\ m > 0 \end{pmatrix}$

108 $x = r \sin\theta$ $(r > 0)$

109 $x = r \sin\omega t$ $(r > 0)$

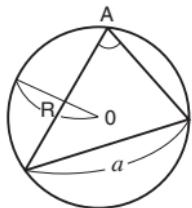
110 $T = 2\pi\sqrt{\dfrac{\ell}{g}}$ $(\ell > 0)$

111 $\left[\dfrac{a}{\sin A} = 2R\right]$ $\left(\begin{matrix}0^\circ < A < 180^\circ \\ R > 0\end{matrix}\right)$

$a = 2R\sin A$

A

R

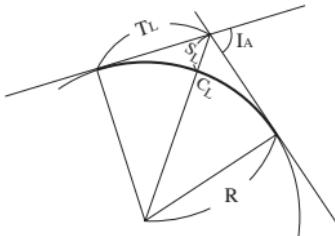
0

a

112 $\left[\dfrac{a}{\sin A} = 2R\right]$

$R = \dfrac{a}{2\sin A}$ $(0^\circ < A < 180^\circ,\ a > 0)$

113 $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C} = 2R$

$\left(\begin{matrix}0^\circ < A,\ B,\ C < 180^\circ \\ a,\ b,\ c,\ R > 0\end{matrix}\right)$

114 **Deg**

$T_L = R\tan\dfrac{I_A}{2}$

$C_L = \dfrac{\pi}{180}\cdot R\cdot I_A$

$S_L = R\left(\dfrac{1}{\cos\dfrac{I_A}{2}} - 1\right)$

T_L

I_A

S_L

C_L

R

115 $I = \dfrac{P}{4\pi r^2}$ $(r > 0)$

116 $S = 4\pi r^2$ $(r \geqq 0)$

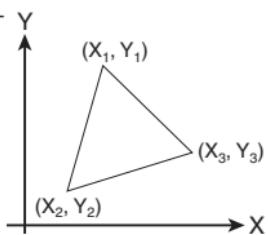
117 $V = \dfrac{4}{3}\pi r^3$ $(r \geqq 0)$

118 $T = 2\pi\sqrt{\dfrac{m}{k}}$ $(m > 0,\ k > 0)$

119 $S = 1^2 + 2^2 + \cdots\cdots + n^2 = \frac{1}{6} n (n + 1)(2n + 1)$

120 $S = K \ell \cos^2\alpha + C \cos\alpha$

$h = \frac{1}{2} K \ell \sin 2\alpha + C \sin\alpha \quad \begin{pmatrix} 0 \leqq \alpha \leqq 90^\circ \\ K, \ell, C > 0 \end{pmatrix}$

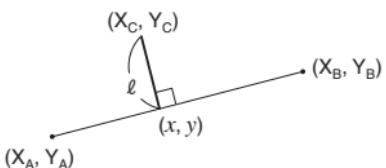
121 $S = \frac{1}{2} (a + b) h \quad (a, b, h \geqq 0)$

122 $\lambda = \frac{\sigma}{E} \ell \quad (E, \sigma, \ell > 0)$

123 $S = \frac{1}{2} bc \sin A \quad (0^\circ < A < 180^\circ)$

124 $S = \frac{|(X_1 - X_2)(Y_3 - Y_1) + (X_1 - X_3)(Y_1 - Y_2)|}{2}$

Y
(X_1, Y_1)
(X_3, Y_3)
(X_2, Y_2)
X

125 $y = \frac{1}{b - a} \quad a < x < b$

$y = 0 \quad x \leqq a, x \leqq b$

126 $F = G \frac{Mm}{r^2} \quad (M, m, r > 0)$

127 $[(X_A, Y_A) \text{ to } (X_C, Y_C) \rightarrow (x, y), \ \ell\,]$

(X_C, Y_C)
(X_B, Y_B)
ℓ
(x, y)
(X_A, Y_A)

$x = \frac{mX_A + \frac{1}{m} X_C - Y_A + Y_C}{m + \frac{1}{m}}$

$y = Y_A + m (x - X_A)$

$\ell = \sqrt{(X_C - x)^2 + (Y_C - y)^2} \quad \left(m = \frac{Y_A - Y_B}{X_A - X_B} \right)$

128 $A_\upsilon[dB] = 20 \log_{10}\left(\frac{V_2}{V_1}\right) \ [dB] \quad (V_2 / V_1 > 0)$